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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/304,830	05/05/1999	MASOUD SAJADIEH	SAJADIEH1-13	1222

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FARKAS AND MANELLI PLLC  
2000 M STREET N W 7TH FLOOR  
WASHINGTON, DC 200363307

EXAMINER
ABELSON, RONALD B

ART UNIT	PAPER NUMBER
2666	

DATE MAILED: 11/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/304,830

Applicant(s)

SAJADIEH ET AL.

Examiner

Ronald Abelson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 and 4 is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 May 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee (US 6,341,140) in view of the Isaksson (US 5,652,772).

Regarding claims 1, 7, and 10, Lee teaches a method and apparatus for frame/code synchronization in a multiplexed environment (multi-carrier direct sequence spread spectrum, col. 1 lines 8 -12). The system comprises a bandpass filter (fig. 2 box 21-1) and a correlator (fig. 2 box 24-1). The bandpass filter is adapted to remove a digital portion of a signal corresponding to at least one digital channel from a received OFDM signal. Referring to figure 2, the Antenna Receiving Signal that is input to the bandpass filter (fig. 2 box 21-1) is the output from (fig. 1 box 16). This signal is an OFDM signal since each of the inputs (15-1 .. 15-m) is orthogonal to the others.

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Each bandpass filter (fig. 2 box 21-1 .. 21-m) is centered at ( $f_1$  ..  $f_m$ ) in order to pass only the digital channel (fig. 2 User Digital Data) that has been frequency shifted (fig. 1 box 15-1 .. 15-m) by an amount corresponding to the bandpass filter (fig. 2 box 21-1 .. 21-m). The portion of the output (fig. 1 box 16) that was multiplexed at different frequencies is removed.

Although Lee teaches a frame synchronizing correlator in an OFDM environment (fig. 2 box 24-1 .. 24-m) the inventor is silent on cyclic extension.

Isaksson teaches cyclic extension in an OFDM environment (PRBS-sequences, fig. 3,4, col. 1 lines 7 - 15, col. 3 line 62 - col. 4 line 7).

Therefore it would have been obvious to one of ordinary skill in the art, having both Lee and Isaksson before him/her and with the teachings [a] as shown by Lee, a bandpass filter and a correlator where the bandpass filter is adapted to remove a digital portion of a signal corresponding to at least one digital channel from a received OFDM signal, and [b] as shown by Isaksson, synchronization of OFDM signals containing cyclic extension, to be motivated to modify the system of Lee by transmitting OFDM data with a cyclic extension. This modification could be performed in software by adding cyclic extension to each transmitted frame. This would improve the

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system of Lee by providing a time reference for sampling the data (Isaksson: col. 3 4-6).

Regarding claim 2, digital portion of at least one digital channel is a portion in a frequency domain farthest from the center frequency of an analog channel contained in the OFDM signal (Lee: fig. 2 box 21-1). The center frequency of the bandpass filter is  $f_1$ , which is the frequency of the generated analog cosine signal transmitted (Lee: fig. 1 box 15-1).

Regarding claim 5, 8, and 11, the bandpass filter is digital (multi-carrier direct sequence spread spectrum communication, fig. 2 box 21-1, col. 2 lines 4-5).

Regarding claim 6, 9, and 12, sync signal based on an integrated detection of respectively correlated cyclically extended portions of a plurality of data frames (fig. 2 box 26, col. 3 lines 53-61).

***Allowable Subject Matter***

3. Claims 3 and 4 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 3, nothing in the prior art of the record teaches or fairly suggests two digital channels, in combination with the other limitations listed in the claim.

***Prior art is of record***

4. The prior art is of record but not relied upon in the office action. Kaiser (US 6,188,717) teaches cyclic extension reduces intersymbol interference of OFDM symbols (col. 6 lines 44-48).

***Response to Arguments***

5. Applicant's arguments, filed 4/30/2003, with respect to the rejection(s) of claim(s) 1, 2, and 5-12 have been fully considered and are persuasive. The examiner agrees with the applicant that the combination of Lee and Bohnke removing a digital portion of a signal for frame synchronization (applicant: pg. 4 last paragraph). Bohnke teaches cyclic extension for burst shaping. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the combination of Lee and Isaksson.

Regarding independent 1, 2, 5, and 6-12, the applicant asserts that Lee does not teach a bandpass filter adapted to remove a digital portion of a signal corresponding to at least one digital channel from a received OFDM signal nor filtering

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out a digital portion of a signal corresponding to at least one digital channel from a received OFDM signal (applicant: pg. 4 3rd paragraph). The examiner maintains that the digital signal (Lee: fig. 1: box 13) is embedded within the received signal. In the receiver each bandpass filter (Lee: fig. 2 box 21<sub>1-m</sub>) removes the portion of the incoming signal that is not centered at the corresponding carrier frequency. Regarding frame synchronization, Isaksson teaches PRBS sequences to achieve frame synchronization in an OFDM environment. The examiner corresponds the applicant's cyclic extension with Isaksson's PRBS sequences.

Regarding the applicant's contention that Lee does not disclose OFDM (applicant: pg. 5 2nd paragraph), the examiner disagrees. Each input (Lee: fig. 1 box 15<sub>1-m</sub>) to the multiplexer (Lee: fig. 1 box 16) is orthogonal to all other inputs.

### **Conclusion**

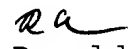
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald Abelson whose telephone number is (703) 306-5622. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be

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reached on (703) 308-5463. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9600.

  
Ronald Abelson  
Examiner  
Art Unit 2666

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November 10, 2003

  
MELVIN MARCELO  
PRIMARY EXAMINER